

THE CLAIMS:

1. A method of identifying at least one predominant color in a digital image, the method comprising applying a detection rule to randomly-selected pixels in the image.
2. The method of claim 1, wherein the detection rule is applied to a strip of randomly-selected pixels in the image
3. The method of claim 1, wherein the detection rule minimizes the probability of at least one of a false-positive outcome and a false-negative outcome.
4. The method of claim 3, wherein the probability of a false-positive outcome is the probability of identifying a color having $r_c < r_a$ as a predominant color, where r_c is the number of pixels in a sample region having a specific color divided by the total number of pixels in the sample region, and r_a is an acceptable ratio.
5. The method of claim 3, wherein the probability of a false-negative outcome is the probability of identifying a color having $r_c > r_d$ as a predominant color, where r_c is the number of pixels in a sample region having a specific color divided by the total number of pixels in the sample region, and r_d is a desirable ratio.
6. The method of claim 1, wherein the detection rule is used to create a color occurrence list.
7. The method of claim 6, wherein the color list is created by testing a first sampling of pixels in the image, for each pixel in the sampling:
if a color vector of the pixel is in the list, incrementing a corresponding counter; and

if the color vector is not in the list, adding the color vector to the list and initializing a corresponding counter.

8. The method of claim 7, further comprising testing at least one additional sampling of pixels in the image, for each pixel of each sampling: incrementing the corresponding counter if a color vector of the pixel is in the list.

9. The method of claim 8, wherein at the end of each additional sampling, all entries with counter $q < T_n$ are removed from the list.

10. The method of claim 8, wherein no additional samplings are tested and the list is finalized if the list is empty or all entries have a counter $q > U_n$, whereby all color vectors in the list are identified as the predominant colors.

11. The method of claim 6, wherein the color occurrence list is maintained as a sorted list.

12. The method of claim 6, wherein the color occurrence list is maintained as a hash table.

13. Apparatus for identifying at least one predominant color in a digital image, the apparatus comprising a processor for applying a detection rule to randomly-selected pixels in the image.

14. The apparatus of claim 13, wherein the processor determines at least one predominant color for each strip of the image.

15. The apparatus of claim 13, wherein the detection rule minimizes the probability of at least one of a false-positive outcome and a false-negative outcome.

16. The apparatus of claim 15, wherein the probability of a false-positive outcome is the probability of identifying a color having $r_c < r_a$ as a predominant color, where r_c is the number of pixels in a sample region having a specific color divided by the total number of pixels in the sample region, and r_a is an acceptable ratio.

17. The apparatus of claim 15, wherein the probability of a false-negative outcome is the probability of identifying a color having $r_c > r_d$ as a predominant color, where r_c is the number of pixels in a sample region having a specific color divided by the total number of pixels in the sample region, and r_d is a desirable ratio.

18. The apparatus of claim 13, wherein the detection rule is used to create a color occurrence list.

19. The apparatus of claim 18, wherein the color list is created by testing a first sampling of pixels in the image, for each pixel in the sampling:

if a color vector of the pixel is in the list, incrementing a corresponding counter; and

if the color vector is not in the list, adding the color vector to the list and initializing a corresponding counter.

20. The apparatus of claim 19, further comprising testing at least one additional sampling of pixels in the image, for each pixel of each sampling:

incrementing the corresponding counter if a color vector of the pixel is in the list.

21. The apparatus of claim 20, wherein at the end of each additional sampling, all entries with counter $q < T_n$ are removed from the list.

22. The apparatus of claim 20, wherein no additional samplings are tested and the list is finalized if the list is empty or all entries have a counter

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